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(71) Applicants
Weyfringe Limited,
(United Kingdom),
Marske,
Redcar,
Cleveland TS11 6NQ.
(72) Inventors
Peter Gleghorn
(74) Agent and or Address for
Service
Hughes Clark Andrews
and Byrne,
63 Lincolns Inn Fields,
London WC2A 3JU.

(54) Label printer

(57) In a label printer adapted for re-cording different label formats and printing labels having variable information in a selected one of said formats, a label format may be entered into memory by a supervisor on entry of a password and thereafter prompts for the several fields of a label in that format are displayed line-by-line on a display. Variable information within the selected format is entered by the operator in response to the prompts using a built-in keyboard.

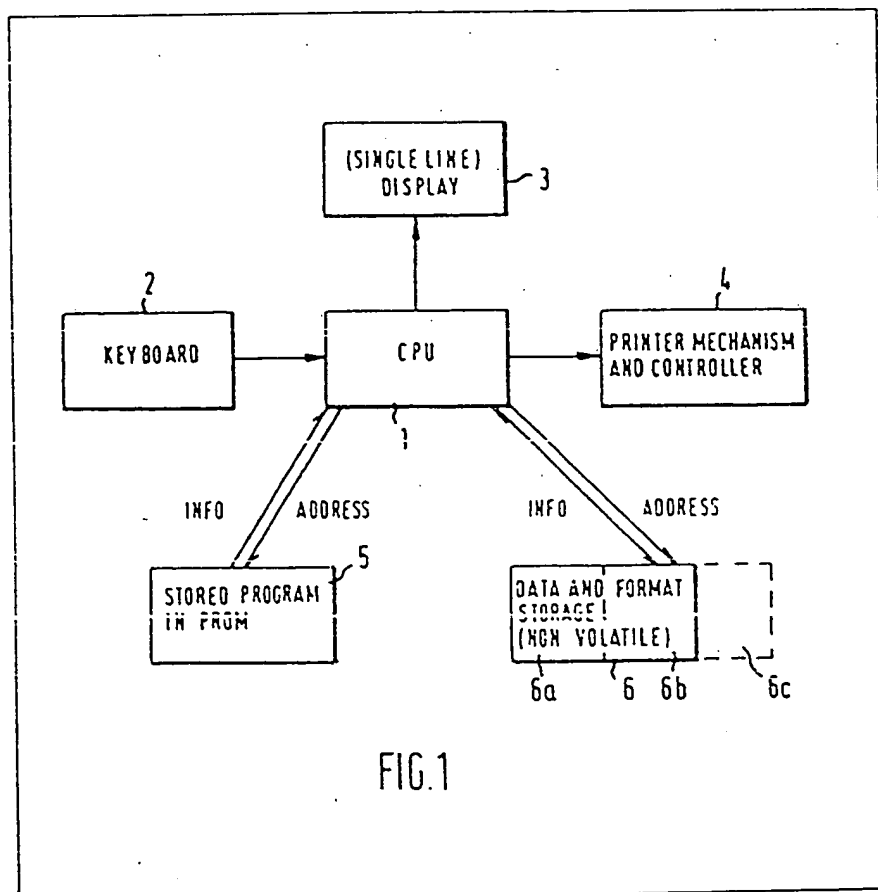


FIG.1

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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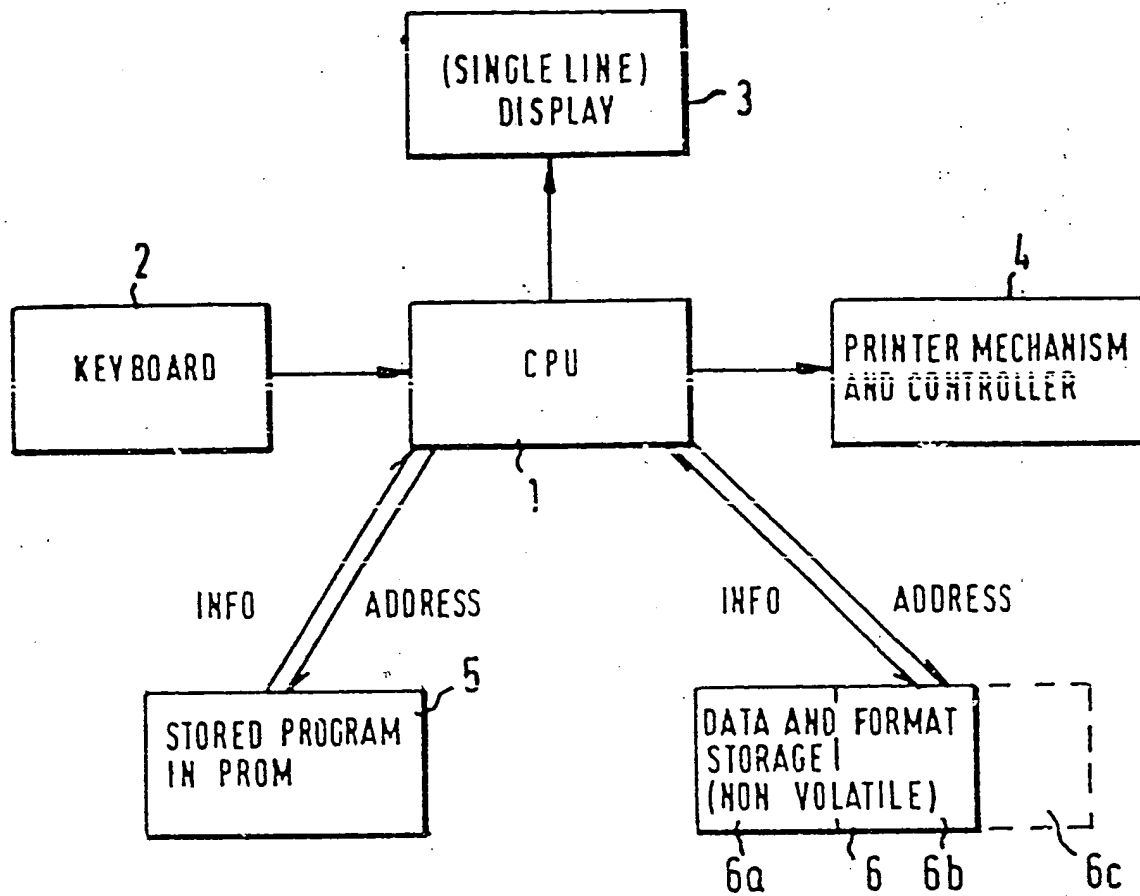
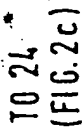


FIG. 1

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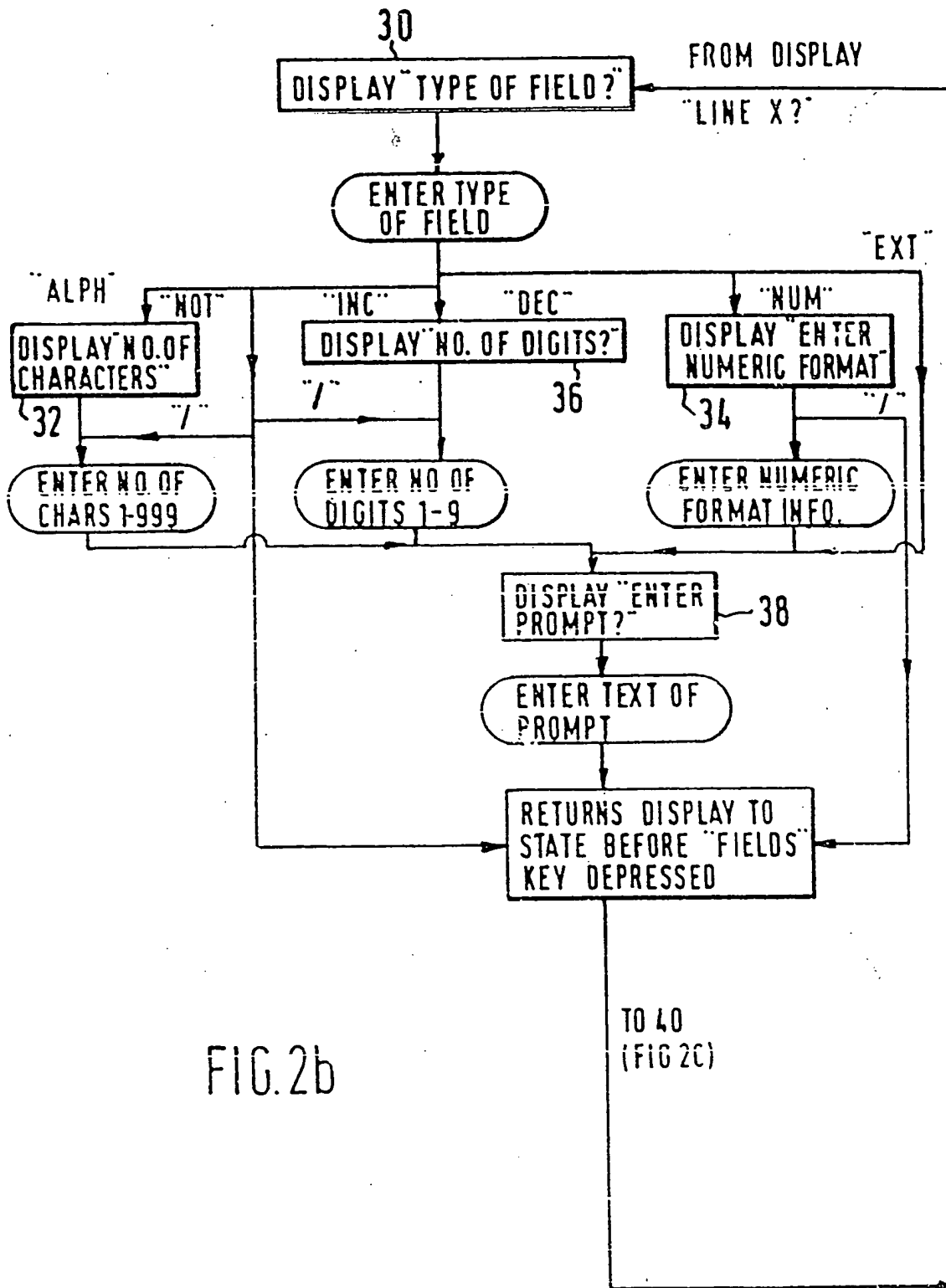
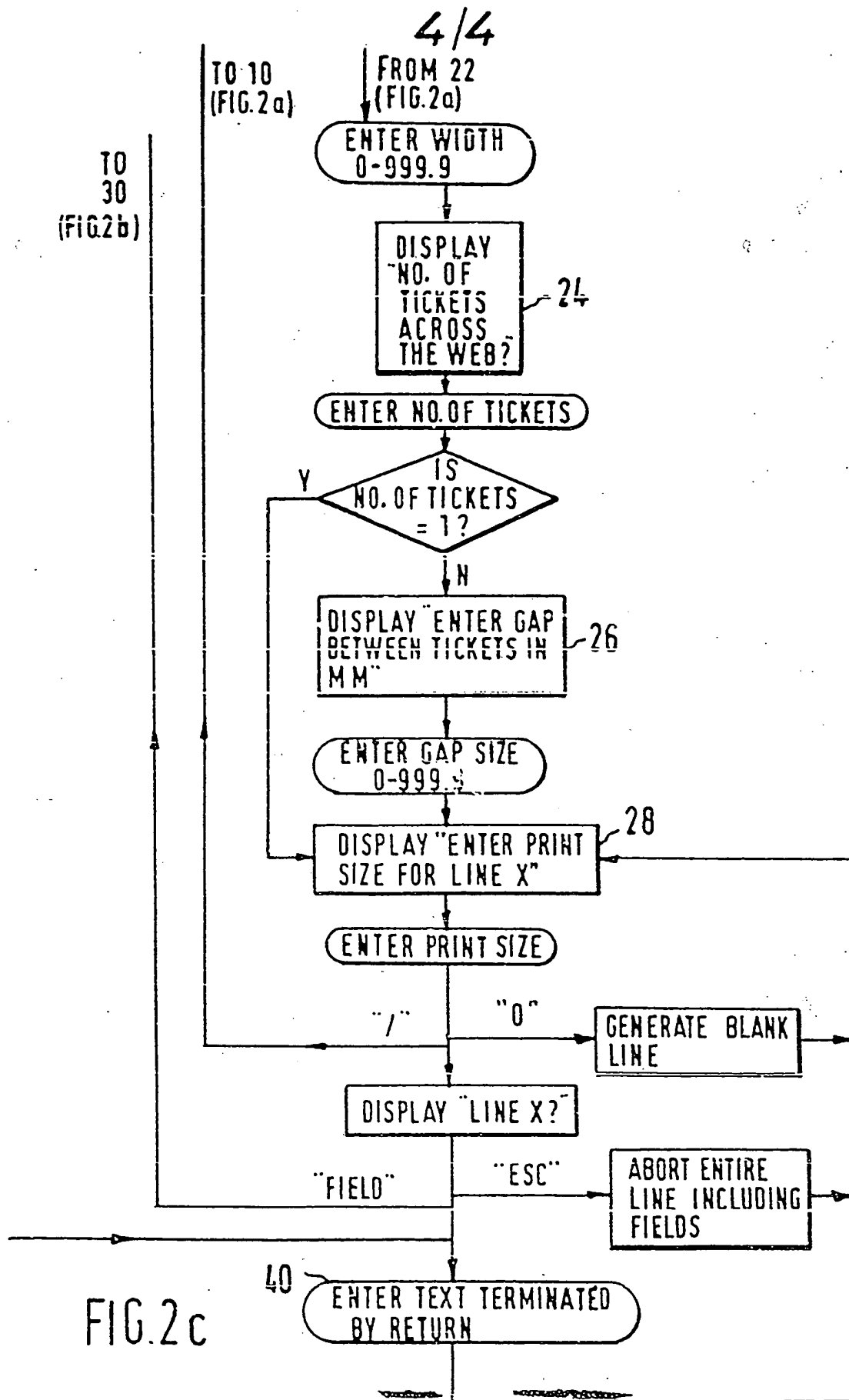


FIG. 2b



on depression of key E on the keyboard he gains entry to supervisor-variable steps and passes to step 12 on the flowchart where he is asked to enter a password. On entry of a valid password he is again prompted 14 to enter a format number. At this step he can by depressing key P on the keyboard enter a new password 16 which can have up to eight characters. If he enters a format number the machine considers 18 whether the format has been used before and if it has been is only enabled to overwrite or modify that format by entry of an affirmative indication 20 that the supervisor wishes to do so. The supervisor is prompted to enter the ticket width 22, the number of tickets across the web 24 and where there is more than one such ticket the gap size between tickets.

The machine then prompts the supervisor at 28 to enter the print size for the first line and after the supervisor has done so displays the first line on the strip display 3. The supervisor then enters the fixed text for the line or part line, presses the FIELD key and proceeds to enter the field at the relevant part of the line and the prompt appropriate to that field. When the supervisor presses the FIELD key, he is invited 30 to enter the type of field that he requires. Among the options available for each field are alphabetical 32, numeric 34 or increasing or decreasing numeric 36. For each field entered the supervisor is invited at 38 to enter an appropriate prompt. When the fixed text and all the fields (if any) and associated prompts have been entered for one particular line the supervisor presses the RETURN key and returns to step 28, repeating the text and field entry loop for successive lines until formatting of the label is complete. Then the supervisor presses the "7" key which returns the machine to its free format mode.

On reselection of the format number at 10 an operator (who need not be the supervisor) enters 42 the number of the format that he or she wishes to adopt for the ticket to be printed. The machine then prompts 44 the user to enter the number of labels required and on entry 45 of this number displays 47 in sequence the prompts for the label which the user fills in. The machine then prints the number of labels required.

The user may sometimes wish to print labels without using one of the supervisor-recorded formats. In order to do so he or she depresses key F and reaches step 50 where he or she is invited line by line to enter a print size 52, enter text for the line 54 and does so 55. On completion of the label the user depresses key "7" and exits from the label generation loop to step 58 where he or she is prompted to enter 60 the number of labels to be printed which are then printed out by the machine.

It will be observed that the machine can be used in any of these modes:

- (a) as a simple label printer in which the user enters and records the text for the label which is simply printed out an appropriate number of times,
- (b) to print out labels according to a selected one of predetermined supervisor variable formats, the user successively entering text for each line according to recorded prompts associated with each field in the line, and entering the number of labels required

to be printed; and

(c) by use of a password the supervisor can enter a label design mode in which lines and fields can be entered for a new or modified label format.

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CLAIMS

1. A label printer adapted for recording different label formats and printing labels having variable information in a selected one of said formats including:

an alphanumeric keyboard for entering information into the printer;

a central processor unit;

read-only data storage means containing a permanently stored operating program for the machine;

random access data storage means including a first set of memory locations accessible only on entry of a password or symbol and arranged to store different supervisor variable prompts each including the number of lines, fields in each line and prompts associated with each field and a second set of memory locations arranged to store operator variable information pertaining to particular labels to be printed in defined formats;

display means arranged to display formatting and operator-variable information relating to a particular line on the label; and

a printer for printing out labels,

the arrangement being such that a supervisor can record or alter predetermined prompts in sequence line by line on entry of the password and the operator can select one of the pre-recorded formats, enter variable information in successive fields in sequence in the format line by line following a sequence of supervisor recorded prompts and cause the completed labels to be printed out.

2. A printer according to claim 1 wherein the stored program causes a format entry prompt to be displayed in the display, on entry of numeric information via the keyboard the stored program causes the CPU to fetch from the first set of memory locations the format identified by that information, and on entry of a first predetermined letter followed by a password the CPU enables the information in the first set of memory locations to be varied.

3. A printer according to claim 2, wherein entry of a second predetermined letter on the keyboard causes the machine to operate as a simple label printer in response to operator-variable information.

4. A printer according to any preceding claim, wherein a disc or tape store is provided for recording supervisor variable information or other variable data.

5. A label printer arranged and adapted to operate substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

SPECIFICATION

Improvements in or relating to label printers

5 The present invention relates to label printers.

The applicants herein have recently developed a range of label printers in which a series of prompts is displayed on to a line display of 28 to 40 characters.

The operator responds to the prompts on this display by entering his replies on the keyboard. The information which he types in substitutes for the prompts on the display. Each application requires a separate programme to be written to define the sequence of prompts, a layout of the particular ticket and the position in which the operator-inserted information is to be placed.

According to the invention the applicants now use a non-volatile RAM within the printer to enable a supervisor employed by the user of the machine to prepare a formatted layout for the type of ticket. In this preparatory phase he will enter the prompt sequence and all the layout information which would have been required to be defined in the specification programming operation. When the format has been stored the machine can be passed over to a less skilled operator who will follow a sequence of prompts generated by the writer of the format. A number of different formats can be stored in any one machine and further programming to store formats on a mini-cassette is envisaged. Accordingly devising or altering a label format is no longer a factory operation, but the various label formats are capable of being formatted or amended by the customer at his convenience. The requirement for individual customisation has been replaced by a universal customer programmable machine.

In one aspect the invention provides a label printer adapted for recording different label formats and printing labels having variable information in a selected one of said formats including:

an alphanumeric keyboard for entering information into the printer;

a central processor unit;

read-only data storage means containing a permanently stored operating program for the machine;

random access data storage means including a first set of memory locations accessible only on entry of a password or symbol and arranged to store different supervisor variable prompts each including the number of lines, fields in each line and prompts associated with each field and a second set of memory locations arranged to store operator variable information pertaining to particular labels to be printed in defined formats;

display means arranged to display formatting and operator-variable information relating to a particular line on the label; and

a printer for printing out labels,

the arrangement being such that a supervisor can record or alter predetermined prompts in sequence line by line on entry of the password and the operator can select one of the pre-recorded formats, enter variable information in successive fields in the format line by line following a sequence of supervisor recorded prompts and cause the completed

labels to be printed out.

An embodiment of the invention will now be described by way of example only with reference to the accompanying drawings, in which:

70 *Figure 1* is a block diagram of a user-programmable label printer; and

Figure 2 is a flowchart illustrating the operation of the printer.

In *Figure 1* a label printer includes a central processor unit 1 connected to a keyboard 2, a single-line display 3, a printer mechanism and controller 4, programmable read-only memory 5 for a stored program for operating the printer and a user-variable non-volatile random access memory 6 containing a first set of addresses 6a in which supervisor variable information pertaining to pre-recorded label formats and prompts, passwords for access to the addresses 6a and the like semi-permanent information is stored and a second set of addresses 6b in which is stored operator or user variable information pertaining to particular labels to be printed. If desired the semi-permanent information may be stored on magnetic tape or disc 6C. The CPU board 1 includes a Z80 microprocessor, 1K or more of non-volatile random-access memory and is optionally connected to a cassette interface board and/or a data capture board. The display 3 is a 28 character single line light-emitting diode display, but it could also be another type of display eg. a liquid crystal display or a fluorescent type of display. It is a feature of the operation of the machine that the labels are displayed line by line and the individual fields and prompt information for each field is supervisor recorded line by line. While the use of a VDU is not excluded, the line by line display enables 28 to 40 character strip displays to be used with complete satisfaction and contributes significantly to the favourable economics of the machine. The keyboard 2 is an alphanumeric QWERTY keyboard in which depression of one of a number of selected keys is arranged by the program stored in memory 5 to exercise a control function. Thus depression of the key F causes the machine to operate in one part of its stored program where it acts as a simple label printer. Depression of key E followed by entry of a valid password enables access to parts of the program that are intended for use only by supervisors. And depression of the key T causes the machine to exit from the program loop in which it is operating and proceed to the next step. The printer 4 may be a dot matrix type of printer such as an Epson MX82-F/T or MX80 type II plus drive electronics that has a set of 96 or 128 characters in a 7 x 9 dot matrix and it may have adjustable or fixed paper width.

120 Suppose, for example, that a supervisor of the printer which has been acquired by a hospital wishes to generate a format for labels containing patient information. The operators of the printer then enter the information relating to particular patients in that format and causing the printer to print out a small number of labels for each particular patient. The supervisor is prompted 10 to enter a format reference number and he can either enter a two-character numeric identifier (in which case he gains access to the relevant pre-recorded label format) or